

## SIGNIFICANT DIGITS

WORKSHEET #2

NAME

*Key*

A) Clearly circle the significant digits in each of the following numbers:

1) 1,200 m

2) 1,350,000 L

3) 45.34 g

4) 3.00 s

5) 3,000,056.92 mm

6) 0.0034 kg

7) 0.023 40 L

8) 0.000 086 s

9) 0.007 95 km

10) 7.600 48 MV

B) Rewrite each of the following numbers to the number of significant digits which is specified in the parenthesis:

1) 1,200 m (1) *1,000 m*

2) 1,350,000 L (2) *1,400,000 L*

3) 45.34 g (1) *50 g*

4) 3.00 s (2) *3.0 s*

5) 3,000,056.92 mm (2)  *$3.0 \times 10^6$  mm*

6) 0.0034 kg (1) *0.003 kg*

7) 0.023 40 L (2) *0.023 L*

8) 0.000 086 s (3) *0.0000860 s or  $8.60 \times 10^{-5}$  s*

9) 0.007 95 km (2) *0.0080 km*

10) 7.600 48 MV (3) *7.60 mV*

## SIGNIFICANT DIGITS

WORKSHEET #3

NAME

Key

A) Clearly circle the significant digits in each of the following numbers:

1) 2,700 m

2) 30,460,000 L

3) 37.42 g

4) 29.00 s

5) 1,200,080.45 mm

6) 0.0017 kg

7) 0.056 20 L

8) 0.000376 s

9) 0.003 45 km

10) 3.011 19 MV

B) Rewrite each of the following numbers to the number of significant digits which is specified in the parenthesis:

1) 2,700 m (1) 3,000 m

2) 30,460,000 L (2)  $3.0 \times 10^7$  L

3) 37.42 g (1) 40 g

4) 29.00 s (2) 29 s

5) 1,200,080.45 mm (2) 1,200,000 mm

6) 0.0017 kg (1) 0.002 kg

7) 0.056 20 L (2) 0.056 L

8) 0.000 376 s (3) 0.000 376 s

9) 0.003 45 km (2)

0.0035 km

10) 3.011 19 MV (3)

3.01 MV

# ADDING SIGNIFICANT DIGITS

WORKSHEET #1

NAME \_\_\_\_\_

Solve the following problems by writing the answers with the proper number of significant digits:

1) 
$$\begin{array}{r} 143.23 \text{ g} \\ + 2.4 \text{ g} \\ \hline \end{array}$$

$145.63 \rightarrow 145.6 \text{ g}$

2) 
$$\begin{array}{r} 1,340 \text{ lbs} \\ - 322 \text{ lbs} \\ \hline \end{array}$$

$1018 \rightarrow 1020 \text{ lbs}$

3) 
$$\begin{array}{r} 34.0034 \text{ g} \\ + 0.04 \text{ g} \\ \hline \end{array}$$

$34.0434 \rightarrow 34.04 \text{ g}$

4) 
$$\begin{array}{r} 78,000,000 \text{ m} \\ - 160 \text{ m} \\ \hline \end{array}$$

$77,999,840 \rightarrow 78,000,000 \text{ m}$

5) 
$$\begin{array}{r} 32.0 \text{ cm} \\ + 1.2346 \text{ cm} \\ \hline \end{array}$$

$33.2346 \text{ cm} \rightarrow 33.2 \text{ cm}$

6) 
$$\begin{array}{r} 0.0023 \text{ s} \\ - 0.351 \text{ s} \\ \hline \end{array}$$

$-0.3487 \rightarrow -0.349 \text{ s}$

7) 
$$\begin{array}{r} 430 \text{ lbs} \\ + 34.2 \text{ lbs} \\ \hline \end{array}$$

$464.2 \rightarrow 460 \text{ lbs}$

8) 
$$\begin{array}{r} 5.89 \text{ L} \\ - 0.035 \text{ L} \\ \hline \end{array}$$

$5.855 \rightarrow 5.86 \text{ L}$

9) 
$$\begin{array}{r} 4,234,000 \text{ ml} \\ 45,600 \text{ ml} \\ + 23,344 \text{ ml} \\ \hline \end{array}$$

$4,302,944 \text{ mL} \rightarrow 4,303,000 \text{ mL}$

10) 
$$\begin{array}{r} 56.486 \text{ m} \\ - 23.35 \text{ m} \\ \hline \end{array}$$

$33.136 \text{ m} \rightarrow 33.14 \text{ m}$

# MULTIPLYING SIGNIFICANT DIGITS

WORKSHEET #1

NAME Key

Solve the following problems, writing the answer with the proper number of significant digits:

1)  $2.34 \times 43$

$100.62 \rightarrow 1.0 \times 10^2$

2)  $13,000 \times 2.46$

$31980. \rightarrow 3.2 \times 10^4$  or 32000

3)  $1.0034 \times 6.48$

$6.502032 \rightarrow 6.50$

4)  $0.0032 \times 6.452$

$0.0206464 \rightarrow 0.021$

5)  $6.8422 \times 6,802,000$

$46540644.4 \rightarrow 46,540,000$

6)  $65.8 / 76$

$0.86789474 \rightarrow 0.86$

7)  $860 / 4.365$

$197.021764 \rightarrow 200 \rightarrow 2.0 \times 10^2$

8)  $97,600 / 23$

$4243.478261 \rightarrow 4200$

9)  $0.157 / 63$

$0.002492063 \rightarrow 0.0025$

10)  $67.9 / 0.46$

$147.6086957 \rightarrow 150$

11)  $2 \times 6$

$12 \rightarrow 10$

12)  $2 / 3$

$0.666666667 \rightarrow 0.7$

**Unit 1: Scientific Notation Worksheet**

1. Write the following in proper scientific notation and state the number of significant digits: ( )

- |                       |                        |                          |                           |
|-----------------------|------------------------|--------------------------|---------------------------|
| a) 0.008              | $8 \times 10^{-3}$ (1) | e) 0.000065              | $6.5 \times 10^{-5}$ (2)  |
| b) 7,120,000          | $7.12 \times 10^6$ (3) | f) 9,470,000,000         | $9.47 \times 10^9$ (3)    |
| c) 325                | $3.25 \times 10^2$ (3) | g) 0.00000000082         | $8.2 \times 10^{-10}$ (2) |
| d) $43.1 \times 10^5$ | $4.31 \times 10^6$ (3) | h) $17.6 \times 10^{-4}$ | $1.76 \times 10^{-3}$ (3) |

2. Perform the following calculations. Be sure to write your answer in proper scientific notation:  
(for the test, physics 1 honors will **NOT** be allowed to use a scientific calculator)

a.  $200 \times 300 = 60000$

$6 \times 10^4$

h.  $(8.0 \times 10^5) / (4.0 \times 10^3)$

$2.0 \times 10^2$

b.  $4.0 / 50 = 0.08$

$8 \times 10^{-2}$

i.  $(9.0 \times 10^{-2}) / (3.0 \times 10^{-1})$

$3.0 \times 10^{-1}$

c.  $0.016 \times 3.0 = 0.048$

$4.8 \times 10^{-2}$

j.  $(2.4 \times 10^{-1}) / (4.0 \times 10^{-3})$

$0.6 \times 10^2$   
 ~~$9.6 \times 10^2$~~   $6.0 \times 10^1$

d.  $7.8 \times 812 = 6333.6$

$6.3 \times 10^3$

k.  $(5.0 \times 10^4) + (3.0 \times 10^4)$

$8.0 \times 10^4$

e.  $(4 \times 10^3) (2 \times 10^4)$

$8 \times 10^7$

l.  $(7.2 \times 10^3) + (5.8 \times 10^2)$

$7.78 \times 10^3$   
 $7.8 \times 10^3$

f.  $(3.2 \times 10^{-5}) (3 \times 10^4)$

$9.6 \times 10^{-1}$

m.  $(8.74 \times 10^2) - (2.3 \times 10^3)$

$-1.4 \times 10^3$

g.  $(6.0 \times 10^2) (7.0 \times 10^4) = 42 \times 10^6$

$4.2 \times 10^7$

n.  $(2.4 \times 10^{-1}) - (4.0 \times 10^{-3})$

$2.36 \times 10^{-1}$   
 $2.4 \times 10^{-1}$

Name: \_\_\_\_\_

Date: \_\_\_\_\_

### Measurement Conversions [Metric to Metric]

1. 3.68 kg = 3680 g

2. 568 cm = 5.68 m

3. 8700 ml = 8.700 l

4. 25 mg = 0.025 g

5. 0.101 cm = 1.01 mm

6. 250 ml = 0.250 l

7. 600 g = 0.600 kg

8. 8900 mm = 8.900 m

9. 0.000004 m = 0.004 mm

10. 0.250 kg = 250,000 mg

## Factor Label Problems

<b>Conversion Factors</b>	1.0 liter = 34.0 fluid oz	1.0 in = 2.54 cm
1.0 ft = 12.0 in	1.0 mL = 1.0 cm <sup>3</sup>	1 yr = 365 days
1.0 mi = 1.61 km	1.0 qt = 32 fluid oz	1.0 kg = 2.2 lbs

### Factor Label Problems

A football player weighs 205 pounds. What is his weight in kilograms?

$$205 \text{ lb} \left( \frac{1 \text{ kg}}{2.2 \text{ lb}} \right) = 93.18181818 \rightarrow 93.2 \text{ kg}$$

If the distance from Philadelphia to New York is 90 miles, what is the same distance in kilometers?

$$90 \text{ mi} \left( \frac{1.61 \text{ km}}{1.0 \text{ mi}} \right) = 144.9 \text{ km} \rightarrow 140 \text{ km}$$

How many centimeters are there in 2.0 feet?

$$2.0 \text{ ft} \left( \frac{12 \text{ in}}{1 \text{ ft}} \right) \left( \frac{2.54 \text{ cm}}{1 \text{ in}} \right) = 60.96 \rightarrow 61 \text{ cm}$$

The length of this piece of paper is 11.0 inches. Convert this length to millimeters.

$$11.0 \text{ in} \left( \frac{2.54 \text{ cm}}{1 \text{ in}} \right) \left( \frac{10 \text{ mm}}{1 \text{ cm}} \right) = 279.4 \rightarrow 279 \text{ mm}$$

A can of Sprite holds 12.0 fluid ounces. How many liters of soda does Sally consume if she drinks 5 can of Sprite each day for 1 year?

$$\text{unlimited sig figs} \rightarrow \frac{5 \text{ cans}}{1 \text{ day}} \left( \frac{365 \text{ days}}{1 \text{ yr}} \right) \left( \frac{12.0 \text{ oz}}{1 \text{ can}} \right) \left( \frac{1.0 \text{ L}}{34.0 \text{ oz}} \right) = 644.117674 \text{ L} \rightarrow 644 \text{ L}$$

*measured value*

### Multidimensional Factor Label Problems

Water flows at a rate of 10 L/min. What is the same rate in qt/s?

$$\frac{10 \text{ L}}{1 \text{ min}} \left( \frac{34 \text{ oz}}{1 \text{ L}} \right) \left( \frac{1 \text{ qt}}{32 \text{ oz}} \right) \left( \frac{1 \text{ min}}{60 \text{ s}} \right) = 0.177083333 \rightarrow 0.2 \text{ qt/s}$$

The density of aluminum is 2.7 g/cm<sup>3</sup>. What is the density of aluminum in hg/L.

$$\frac{2.7 \text{ g}}{\text{cm}^3} \left( \frac{1 \text{ hg}}{100 \text{ g}} \right) \left( \frac{1 \text{ cm}^3}{1 \text{ mL}} \right) \left( \frac{1000 \text{ mL}}{1 \text{ L}} \right) = 27 \text{ hg}$$

A car travels at a rate of 60 mi/hr. What is its speed in Km/min?

$$\frac{60 \text{ mi}}{\text{hr}} \left( \frac{1.61 \text{ km}}{1 \text{ mi}} \right) \left( \frac{1 \text{ hr}}{60 \text{ min}} \right) = 1.61 \text{ km} \rightarrow 2 \text{ km/min}$$

A speed reader can read 350 words/min. Assuming that each word is 5 letters in length, how many letters does the reader read each second?

$$\frac{350 \text{ words}}{1 \text{ min}} \left( \frac{5 \text{ letters}}{1 \text{ word}} \right) \left( \frac{1 \text{ min}}{60 \text{ s}} \right) = 29.1666667 \rightarrow 29 \text{ words/sec}$$